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ABSTRACT

Two major areas of focus emerge from this synthesis of national reports: the question of how to teach students critical and autonomous judgement with regard to the mass media, and how best to use new information and communication technology (NICT) and the media for educational purposes. It is noted that, although there are differences of approach among countries and varying attitudes and value judgements about the use of NICT in the classroom, most agree that NICT will be a useful educational tool. Distinctions are made between providing education in the enlightened use of information, using information technology for teaching and learning, and teaching about information technology. NICT's capacity to facilitate worldwide communication is cited, and several NICT-related objectives are suggested: to teach pupils the capacity to synthesize what they are exposed to in the media; develop and exercise their critical faculties; preserve cultural heritages; teach judgement in choosing media resources; offer equal educational opportunity for all; and teach self-expression. The paper argues that a key factor in teaching with NICT is encouraging active interaction with the material and between teacher and student, and that adequate teacher training programs must be established. Further educational results of mass information media are cited: the founding of open universities; the use of television and radio broadcasts, cassettes, and computers in distance education; and improvement of education for the disabled. A brief discussion of the copyright problem concludes the paper. Twelve footnoted references and a 14-item bibliography are provided. (MAB)

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The information society and education: synthesis of the national reports

Report by Professor Gilbert de Landsheere
University of Liège (Belgium)

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Forty years
Council of Europe

Strasbourg 1989

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THE INFORMATION SOCIETY AND EDUCATION :

Synthesis of the national reports

Report

by

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CONTENTS

	Page
SUMMARY	1
INTRODUCTION	4
CHAPTER 1 - INFORMATION	6
1.1 Education in the enlightened use of information	7
1.1.1 Information is not an isolated phenomenon	7
1.1.2 The educational challenge	9
1.2 The use of information technology for teaching and learning purposes	9
1.3 Teaching information technology	12
CHAPTER 2 - DEFINITION OF THE INFORMATION SOCIETY	13
2.1 The "conventional" media	15
2.1.1 The press in schools	15
2.1.2 School radio	16
2.1.3 Cinema	16
2.1.4 School television	17
2.2 Information technology	18
2.3 The new media	19
2.4 Educational objectives	19
CHAPTER 3 - NICT, A NEW FOCUS OF KNOWLEDGE	23
3.1 Effects on education policy	23
3.2 Effects on course content	25
3.3 Effects on teaching methods	26
3.4 Effects on the recruitment and training of teaching staff	28
3.4.1 Recruitment	28
3.4.2 Initial teacher training	28
3.4.3 In-service teacher training	29
CHAPTER 4 - NICT AT THE SERVICE OF TEACHING AND LEARNING	32
4.1 As an aid to subject studies	32
4.1.1 Open universities	32
4.1.2 Distance learning	33
4.2 Education of the disabled	34
CHAPTER 5 - COPYRIGHT	36
BIBLIOGRAPHY	37

SUMMARY

Introduction

Two main areas of focus emerge from Professor De Landsheere's synthesis of national reports. (These are reproduced in MED-16-7). One is the question of how to teach students critical and autonomous judgement with regard to the mass media, and the other is how best to use new information and communication technology (NICT) and the media for educational purposes. Though there are differences of approach among countries and varying attitudes and value judgements about the use of NICT in the classroom, most agree that NICT, when used for the purpose of education, will be a useful tool. Yet the process of introducing NICT and media in schools has not been sufficiently evaluated, despite the fact that the media have become a vital aspect of society.

Chapter 1 - Information

This chapter makes the distinction between providing education in the enlightened use of information, using information technology for teaching and learning, and teaching about information technology. Each aspect is discussed in turn. As for the first, after rehearsing the different levels of cognition - from simple perception to the higher cognitive processes of analysis, evaluation, and synthesis - the author shows that all education should help bring pupils closer to the goal of learning to react intelligently to information. Most of the national reports agree that this should be a task for all fields of learning, and not any particular one. As for the other two aspects, the conclusion is that while teaching information technology (computer culture and specialist knowledge and skills) has gained a secure foothold in school curricula, particularly at the secondary and higher levels, the computer as a teaching aid is still far from establishing itself, since the necessary "critical mass" of computers, software and trained teaching staff has no where been reached.

The poor quality of educational software is also mentioned. Due to increasing illicit copying of software, there is little hope that commercial companies will continue large scale investment in this area. Only the establishment of public services producing software on a national or regional scale and working in close collaboration with similar services in other countries will enable this hurdle to be cleared.

Chapter 2 - Definition of the Information Society

One fear related to NICT is that young people will be overwhelmed or manipulated by over-information. In this case, it is especially the underprivileged who will be affected if information technology becomes a factor in "economic warfare". Differences in receptivity inherent in social and cultural differences and between generations must be respected when working with NICT. It must be kept in mind that an information society must also remain a humanistic one in which all benefit from technological advances.

Among the conventional forms of media, the press was the first to be introduced in the classroom to teach students about current events. This represented an opening up of schools to the outside world and soon included radio, TV, film, and videos. Countries such as the United Kingdom are now facilitating more educational programmes through public service broadcasting.

The author cites NICT's capacity to facilitate worldwide communication. Translated into educational terms, this suggests that young people will have more exposure to world problems, different cultures, etc. The hoped for result is a deepening of reflection about and knowledge of other peoples. In order to serve both individual and societal interests, several NICT-related objectives are suggested:

- teach pupils the capacity to synthesize what they hear and see in the media
- develop and exercise critical faculties
- preserve cultural heritage and distinctions
- teach discrimination and judgement in choosing media resources
- offer equal educational opportunity for all
- teach self-expression.

Education should also aim to combat the mindlessness and other negative aspects of the media. For example, Austria suggests making constructive use of the media by helping students become discerning media consumers, find meaning in their experience with media, and exercise creativity by producing their own media projects.

Chapter 3 - NICT, A New Focus of Knowledge

As of yet, there is little data available on the results of large-scale application of NICT in education. Such data will eventually be useful in evaluating the effectiveness of NICT teaching. In the meantime, there are lessons to be learned from older teaching methods with media materials.

Computers and information technology will have several effects on teaching methods, both because of the vast amount of data made available and because of the increasing need for proper education in putting the information to intelligent use. A key factor in teaching with NICT is encouraging active interaction with the material and especially between teacher and student, rather than passive intake and rote memorisation. When applied successfully, NICT will transform traditional didactic teaching into a lively and more involved process. Teachers will have more freedom to experiment with teaching methods and be able to allow for more personalisation in the classroom.

For educational reform to occur, adequate teacher training programmes must be established. Increasingly, governments are requiring that future teachers take at least an introductory course in computer literacy. Yet even among the trainers themselves there exists the difficulty of keeping abreast of the most recent developments.

Some countries have taken steps to provide in-service training for teachers, especially in computer science, to keep them up to date with the latest NICT techniques. Some have even experimented with televised distance education programmes. Unfortunately, such training usually consists of short courses focused on the technology itself rather than on its implications for teaching methods.

Chapter 4 - NICT at the Service of Teaching and Learning

A further educational result of mass information media is the founding of open universities, designed to offer education to all adults, who may design their own courses and progress at their own pace. Open Universities also serve as a testing ground for adult education methods as well as for educational applications of information technology.

NICT has also greatly contributed to distance learning through television and radio broadcasts, cassettes, and computers, and now allows for much more interactivity between student and teacher. Education of the disabled has also been improved with technological advances and computer-assisted learning.

Chapter 5 - Copyright

Copyright violations have become an increasing concern for both the authors of software programmes and the schools that use them. Steps must be taken to regulate copying and prevent further pirating of materials.

INTRODUCTION

It is now widely acknowledged that many young people devote more time to watching television than to their education and that radio, television, newspapers and magazines often occupy more of adults' time than their occupational activities do.

In response to this situation, two ideas are emerging: the need to equip the young and the less young to cope with this bombardment from the media, and the possibility for formal education of deriving some advantage from the parallel education system offered by the media.

Equipping ultimately amounts to enabling people to understand the operation of the media and judge them critically on the basis of high-minded values.

Opening up the education system to the flood of information outside simply means opening it on to the world and on to the realities of life.

While there is a unanimous desire to prepare people for life, the various national reports reveal fairly considerable differences of approach between countries or autonomous regions towards institutional measures. In some cases media education is a major part of the curriculum, while in others it is far less formalised and may even be left to the collective responsibility of a school's teachers as a whole. Sometimes it is also made available to adults as part of adult education schemes, while sometimes there is no sign at all of any such arrangement.

Attitudes and value judgments regarding extracurricular information also vary. Some parents and teachers almost regard the penetration of information and media messages into schools as a type of pollution, or at any rate as a form of expression lacking any artistic value (1). Nevertheless, certain comments encountered in the national reports, though marginal, do suggest that such negative reactions are very much on the decline.

There is little doubt that young people learn a great deal through the media and are influenced by them in their interests, attitudes and values. However, the process has never been evaluated with any reasonable degree of rigour, and this is a serious deficiency.

Nothing can alter the fact that new information and communication technology (NICT) is finding its way into schools, where its presence is bound to be increasingly felt. One of the surest facts in educational psychology is that learning has no real prospect of success unless it is founded on the learner's own experience and problems. By attempting to exclude the media, education would be blacking out a vital aspect of life.

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(1) A 1982 UNESCO (Grünwald Symposium) report emphasises the need to strike a new balance between the education system and the communications system, which tend to ignore or even oppose each other.

Should media education be general or specialised? There is a clear trend towards a general education based, in the most favourable cases, on active participation. Creating media messages is surely the best means of understanding them. However, this remark needs to be substantially qualified with regard to information technology, to which several countries devoted the bulk of their reports. A movement in favour of imparting a general knowledge of information technology is clearly emerging in secondary education, but it is difficult to judge whether it already carries as much weight as the technical approach.

Agreement is virtually unanimous that NICT can improve teaching methods and the content of a large number of subject areas. So far, however, hopes have often been dashed. Only rarely have curricula been revised in the light of the new opportunities and, above all, inadequate provision has been made for the necessary teacher training. The more progress is made, the more the key importance of this factor is recognised - and the more complicated the situation appears.

Even though many trainee primary school teachers are given a general introduction to information technology, the benefit of this may well be jeopardised by the lack of opportunity to use high-quality teaching software in practice. Moreover, the falling birth rate often restricts the scope available to young teachers. Courses and seminars for teachers already in post are provided almost everywhere, but their relevance is still far from established. The action really needed in order to alter teaching approaches in a significant way does not yet appear to have been identified.

Here lies the major priority for educationists, for there is a danger that micro-computers will end up gathering dust on the shelves alongside audio-visual material.

Effective ways of providing meaningful in-service training for teachers must therefore be sought as a matter of urgency. The next stage is to seek ways of reaching at least a critical mass of trained teachers, which means several million teachers for the Council of Europe member states as a whole.

However the education system is organised, it cannot do its job all by itself. Not only should all the parties concerned support its efforts - hence the need for family training (cf. UNESCO, 1982) - but the media themselves should shoulder a major share of responsibility. Here, too, the obstacles to be overcome are enormous, since quite apart from the economic interests involved, particularly where advertising holds sway, the dynamics of the mass media are largely incompatible with the principal objectives of education.
José Vidal-Beneyto summed up this antithesis very graphically at the beginning of the preparations for the 16th Session of the Standing Conference by postulating that the communication society is based on three main principles: emphasis on bad news rather than on constructive or positive aspects; repetition, particularly in advertising and publicity, rather than innovation; a preference for the immediate and the ephemeral, rather than the durable and the well-established.

Education has a duty to take up all these challenges as the 21st century draws near. If used properly, NICT can contribute to this effort, and probably in a decisive fashion.

CHAPTER 1 - INFORMATION

What distinguishes the traditional media - the press, radio, etc - from the new ones is the role of the computer, which, thanks to digitalisation, can store, process, shape, select, transmit, interpret and even (heuristically) create information (1). In fact, there are now few media in which the computer does not play a part; hence Francis Balle's remark that information technology exerts a unifying influence on the media, blurring the boundaries between them.

The most promising future prospects for education lie in the possibility of combining the media and information technology, for some extraordinary opportunities are thereby emerging for truly interactive education (Switzerland).

The ubiquitous nature of the computer in the new media context, for which it is increasingly playing a subordinate but essential role as conveyor, classifier, translator and "processor", has led some to equate it, or even the entire NIT sector, with a medium in itself. This close partnership between computers and media accounts for the Federal Republic of Germany's view that media education also includes computers. It is surely wrong, however, to go as far as the report on a European workshop held in Prague in 1987, at the European Information Centre for Further Education of Teachers, which, according to a UNESCO document of May 1988, states: "Computers is here used as a shorthand term for the range of new technologies of information and communication available for classroom use" (2).

It is now several years since P Schaeffer (3) pointed out that only by a questionable extension of the meaning of the term could information technology as such be equated with a mass communication medium.

It may readily be understood why information technology (equipment, teaching, application, budgets) occupies a significant or even exclusive place in many of the national reports, although as a result the means of production or transmission has been accorded more importance than the product itself.

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(1) On the complex nature of information, the selectivity of its representations, its ideological power, its agenda-setting functions and its amplification of the dominant discourse, see, inter alia, the report by L MASTERMAN, Impact of mass communication media on curriculum development and educational methods (Final Report of the UNESCO European Workshop held at Tutzing, Federal Republic of Germany), Paris, UNESCO, 1986.

(2) UNESCO, Informatics in Education, ED-88/MINEDEUROPE Reference document 5, Paris, May 1988, p 9.

(3) P SCHAEFFER, Mass Media and the School: Descartes or McLuhan, in Media Education. Paris, UNESCO, 1984, p 56.

In fact, over and beyond the problems raised by the adequate equipping of schools with hardware and software, a clear distinction between three different aspects should be made, at least for teaching purposes:

- a study of the problems involved in teaching information technology;
- a study of the problems of using information technology for teaching and learning;
- a study of ways of providing education in the enlightened use of information.

The first aspect concerns the definition of a specific teaching technique forming part of a wider teaching methodology.

The second aspect comprises two elements: (a) independent learning; and (b) the use of computers as educational aids, which teachers and pupils must learn to use, with the interaction between skills and processing (in this case, teaching skills and courseware quality) once again being of decisive importance.

The third and final aspect concerns the daily lives of children and adults, at almost every waking hour, at least for those who live in what is commonly called the information society.

1.1 EDUCATION IN THE ENLIGHTENED USE OF INFORMATION (1)

1.1.1. Information is not an isolated phenomenon

Unlike artistic experience, information does not stand in isolation. Whether intentionally or otherwise, it has the effect of stimulating a learning process whose implementation, nature or impact should ideally be controlled by the receiver. It is, of course, possible for a wide variety of resources and devices to be deployed by transmitters to maximise the chances of their message making an impact. Manipulation techniques have even been developed for the purpose of reducing the receiver's free will. The French report quotes Liliane Lurcat who, in this context, describes the restrictive effect of the passive, uncritical and one-way relationship between a fascinated viewer and television. The result is a process of learning by impregnation, characterised by the learner's unawareness. As the Liechtenstein report notes, all ability to think may disappear.

In normal conditions, an individual's reaction to the receipt of an item of information is situated somewhere along a continuum ranging from nought to the most sophisticated use of his critical faculties. Nought corresponds to a situation where an item of information reaches the individual (eg film star X has been selected for a particular part) and is understood by him (simple cognition), but is not memorised. In this case, information is by no means synomymous with knowledge, a matter to which the Turkish report devotes an interesting discussion.

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(1) On the media education question see also the important work by L MASTERMAN, The Development of Media Education in Europe in the 1980s, Council of Europe, Council for Cultural Co-operation, Strasbourg, 1988.

Simple memorisation - which might be described as a mechanical process - goes a little further. Many do not proceed beyond this point and indeed sometimes boast of having amassed a parrot-like store of knowledge ("nothing more than unintelligent ingestion").

At the next stage the information stored is applied in an uncritical fashion. The use of such-and-such a product is advised, such-and-such a course of action is recommended, and these suggestions are unquestioningly acted upon as soon as the opportunity arises.

These three initial stages are characteristic of the lower cognitive processes.

The situation is entirely different when the individual analyses the information and holds it up against the criteria of truthfulness, honesty and usefulness - in other words, when he examines it critically and evaluates it.

Such a process, which depends initially on analysis, may be followed by synthesis. This becomes creativity in the event of the production of a new structure, either in absolute terms or in relation to earlier productions by the same individual.

Analysis, evaluation, synthesis and creativity are the "noble" operations, the higher cognitive processes.

This is the context of an important passage of the Swedish report, which mentions that Sweden has not completely and unreservedly accepted the existence of the information society as an established fact. The report goes on to say that "unreflecting adoption of information technology can have the effect of jeopardising essential democratic values in our society" and that "the key resource of society tomorrow will be knowledge rather than just information. (...) The term information indicates a direction to be followed: it is the informant who announces what the uninformed is to be allowed to know. The knowledge society is based on the opposite conception: its aim is to strengthen the possibilities for the individual himself to appraise and evaluate different alternatives".

The report of Belgium (French-speaking community) displays the same fundamental concern when it stresses that reliable and objective information requires, apart from lucidity and non-conformism, a sound knowledge of social mechanisms and a good command of communication processes and information techniques.

Ideally, young people should be persuaded to subscribe to "an internationalist code of ethics, making them sensitive to the need for solidarity among all human beings" (French-speaking Belgium). All media education should include the passing on of values.

Such is the background to educational schemes and programmes intended to teach the intelligent and enlightened use of the information which the media lavish upon us - indeed in such profusion as to entail the risk of disinformation.

The individual, having access to a virtually unlimited amount of practical, technical, scientific and cultural information, is in danger of embarking on an increasingly erratic process of information gathering. Pigasse (1) writes that this surfeit of information may well in the end lead to under-information.

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(1) J P PIGASSE, La révolution de la communication, Communication et Langage, 1981, 50, p 17.

He describes this as the "interference phenomenon" whereby the influx of unwanted information paralyses electronic communication systems.

One aspect often overlooked in connection with the use of information is the transition to action.

It should always be remembered that knowledge means not only being acquainted with facts but also being able to act on the basis of the information and theoretical knowledge acquired.

1.1.2 The educational challenge

It would be wrong to think that specific exercises, such as a critical examination of the press, are sufficient for the purpose of learning to react intelligently to information. In fact the entire educational process should, from the earliest age, help to bring the pupil closer to this goal, and hence all aspects of teaching methodology are involved.

The task is all the more tricky as pupils spend a considerable amount of their time in receiving information from out-of-school sources which do not pursue the same objectives as school education. Television in particular, if watched undiscerningly, can become an instrument of "cultural impoverishment" (French-speaking Belgium).

Just as pupils are very poorly prepared to make proper use of freedom and democracy if they have never experienced anything but the authoritarian imposition of knowledge, technical skills and life skills, so they will, unless taught day in day out how to lead an active and effective life in the information society, run the risk of becoming seriously alienated.

The importance latterly accorded to metacognitive processes is fully justified: pupils (and their teachers) should indeed constantly question their knowledge (and therefore, in particular, their information) and learn to apply validity-, sufficiency- and logic-testing strategies to arguments, inferences, conclusions, etc.

The idea that education in the proper use of information should be a task for all fields of learning, and not any particular one, emerges from most of the national reports. It is worth emphasising here that this education cannot be authoritarian or coercive without defeating its very purpose.

1.2 THE USE OF INFORMATION TECHNOLOGY FOR TEACHING AND LEARNING PURPOSES

It is unlikely that teaching will ever cease completely to be a collective activity. The problem is not, therefore, to provide an individual teacher for every pupil, but to identify forms of group education whose efficiency is comparable to that attained in the ideal situation of individual tutoring. Current research has shown that this is possible (1).

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1. See B S Bloom's striking essay, "Le problème des deux sigmas: trouver des méthodes d'enseignement collectif aussi efficaces qu'un précepteur". In M CRAHAY and D LAFONTAINE, L'art et la science de l'enseignement, Brussels, Labor, 1986.

A teacher, faced by his group/class, should act as the conductor of an orchestra whose instruments are the various teaching resources: lecture-type teaching alternating with independent study, class work alternating with work in small groups or individual work, use of textbooks or other reference works and of the entire range of conventional audio-visual aids, exploration of the environment, the possibility of meetings with educators other than the class teacher, computer-assisted learning and so on.

As the list shows, the computer is but one instrument in a large orchestra, an instrument whose proper place cannot yet be assessed. One thing seems sure: it will not occupy this place unless it fits functionally into the current educational process. Ideally, each pupil should be able to use a computer whenever he feels the need to do so and with the same facility as he would consult a text book or use some other kind of teaching material.

An initial requirement can thus be seen: the need for an adequate number of immediately available computers. Even on the minimum assumption of 20 minutes' use per pupil per day (1), it is clear that even the countries which are at present the most advanced will not have enough computers by the year 2000.

It can be calculated, on the basis of a recent CERI publication (2), that there are approximately 9 micro-computers in each secondary school in a group of 11 Council of Europe member States (Austria, Denmark, France, the Federal Republic of Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Sweden and the United Kingdom). The computers are usually grouped together in one room, which is scarcely calculated to facilitate their use for purposes other than computer science.

The problem is not confined to hardware. The CERI report stresses that, with the exception of technical schools, no teaching establishments, whether primary or secondary, seem as yet to have attained the "critical mass" of computers, software and properly trained teaching staff.

In the present circumstances, even if a sufficient quantity of educational software did exist, it is far from certain that teachers would make the best use of it at the right moment. As is surely known, tried and tested techniques of individualised teaching have existed ever since the early 20th century and are explained to trainee teachers, but are scarcely ever put into practice.

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(1) This is the hypothesis advanced by E MELMED, Educational Productivity, the Teacher and Technology, Washington, US Dept.of Education, 1983, pp.3 and 4 (mimeographed).

(2) OECD-CERI, The Use of Microcomputers in Education. Implications for Teachers. (Note by the Secretariat), Paris, August 1988.

The poor quality of educational software is also a long-standing problem. The development and testing of complex software conforming to demanding psychological and educational standards is costly. With illicit copying further aggravating the situation (the Yugoslav report speaks of a black market in software), there is not much hope that commercial companies will invest on a large scale in this area. ("We cannot expect the publishers to make the investment in software provision all on their own" - Netherlands). Only the establishment of public services producing software on a national or regional scale and working in close collaboration with similar services in other countries will enable this hurdle to be cleared.

International collaboration should not, however, obscure the fact that the introduction of information technology into education raises specific problems in each country and that local solutions are essential, if only for linguistic reasons (eg Greece, Iceland).

The San Marino report makes an important comment with regard to software: much software is based on "programmed teaching". But many teachers do not readily accept predetermined learning programmes. Similar observations in other countries suggest that basic software which allows wide scope for flexible intervention by teachers will often be more readily accepted and used.

The overall picture is far from satisfactory, which explains the present stagnation in many countries. Disappointment is acute when miracles fail to happen. Now that the irrational stage is over, the situation appears less favourable. A study begun by the Italian Ministry of Education in 1984 has revealed a disturbing symptom, namely a low rate of use of computers installed in schools (32% were, incidentally, unusable at the time of the survey). In 1985, another Italian study showed that only 70% of the equipment avaiable was being used.

Again in 1985, a report by the General Inspectorate of the French Ministry of National Education showed that despite the growth in the number of computers available, actual classroom use of micro-computers had remained stable or even decreased (OECD-CERI). This finding should, of course, be updated and supplemented. A point particularly worthy of note is that in Scotland, where teacher training has been given special attention, the computer is now securely established in schools.

From a rather more distant viewpoint, the present overall situation may be described as follows:

Secondary schools have, so far, been in a considerably better position than primary schools, several countries still being unsure of the wisdom of making computers available to children of less than 12 years of age.

Where primary schools do possess computers, they have been used, especially to begin with, to provide pupils with drill and practice programmes or to introduce pupils to the Logo environment for which there has developed a real craze. The situation is changing in both respects. First, programme quality is gradually improving, and second, the use of word-processing software and the use and even constitution of databanks are increasing.

Secondly, interest in the Logo environment seems to be decreasing, sometimes markedly in certain countries (notably the United Kingdom). In general and technical secondary education, the information technology aspect predominates, either in the form of general information technology or the systematic study of this technology. At this level of schooling, the computer is still relatively little used in most countries in subject teaching.

A clear distinction needs to be made, however, between the use of computers per se and the use thereof as information-technology tools such as word processing programmes, spreadsheets, data-base managers, graphics systems or programmes controlling turtles and various other robots, not forgetting electronic mail.

The publication of school newspapers, together with information exchanges which sometimes assume an intercontinental dimension, is giving a new lease of life to one of the principal instruments of active teaching. Moreover, the creation by pupils of databanks in various fields tackled by them is of major educational value. On the other hand, the role of interactive video-disks has not yet been defined.

Over and beyond these considerations, one thing is certain: schools must initiate their pupils in the use of computers as early as possible, without in any way trying to turn each one into a computer scientist. Experience shows that an intelligent introduction to the use of computers can be effected from primary school onwards, starting either with a technique such as word processing, or with a brief initiation in the Logo environment or similar constructivist approaches.

1.3 TEACHING INFORMATION TECHNOLOGY

Many leading experts feel that anything more than a superficial knowledge of information technology is of use only to those who intend to make a career in this field. For others, the use of computers would involve no more specialised knowledge than the average motorist has of mechanics, electricity or - as will soon be the case - information technology. For example, the United Kingdom report speaks of a scale of objectives to be attained in education in information technology and micro-electronics.

The principle of a certain computer "acculturation" for all seems to be increasingly widely accepted in the light of the expanding role of computers in practically all walks of life. In most cases, this process takes place during secondary education.

In the broadest terms, this involves imparting a computer culture not only in the form of specialist knowledge and skills, but also as a new way of thinking (Italy). "Information technology is a faculty or force that is totally permeating concrete and abstract reality and creating new conceptions, new forms of interpretation, new ways of management and new insights into our lifestyle" (G Secchi, Italy). Clearly, the teaching of information technology as a specific subject contributes not only to the above-mentioned psychological development; its use as a tool for other subjects also plays a major part.

Clearly, information-technology teaching has already gained a secure foothold in school curricula, particularly at the secondary and higher levels, while the computer as a teaching aid is still far from establishing itself.

CHAPTER 2 - DEFINITION OF THE INFORMATION SOCIETY

F Balle's report examines the nature of the information society in depth. From this point of view, the value of the national reports resides in their choice of what aspects they regard as the most noteworthy ones.

At the more general level, the Holy See expresses a fear and a hope. The fear is that young people will be manipulated by over-information, a danger which threatens the most deprived in particular, for they are less well supported by the socio-cultural environment. Moreover, a type of education designed to allow the "best" to win in "economic warfare" is a serious threat for those most at risk.

The hope is that increasing communication between people will develop a greater sense of the universal and greater interest in cultural differences: "...when taking decisions relating to the education of young people, it is important to consider what underlies the outstanding dignity of every human being."

All the reports agree on the salient features of what might be called the physical properties of contemporary information - its mass, its multiplicity of form, its speed and its transnational nature.

The French report emphasises the extent to which present-day information disregards all national boundaries, while Portugal notes "a universalisation of the interdependence of nations". This trend will not, however, efface the differences in receptivity inherent in social and cultural differences or, quite simply, the generation gap (Turkey).

The influx of international information which, in some countries, accompanies an influx of foreign visitors - whether business people, or tourists - is causing considerable changes in families and schools and at workplaces, particularly in the case of countries which, like Cyprus, were until recently fairly isolated: attitudes and lifestyles are transformed and enormous adjustments are occurring in values, especially among young people.

Indeed, surely it could hardly be otherwise, as the information explosion is simultaneously affecting intellectual life (NIT is a potential amplifier of human intelligence - Spain), the law, politics, economics, the arts, leisure activities, etc.

Greece predicts that the very structure of society will be modified.

The report by the Federal Republic of Germany points to three particular indicators of the advent of the information society:

- the constant expansion of the "production" of information or knowledge (said to be doubling every five or six years at present);

- the permanent increase in the proportion of the active population involved in the production, processing and transmission of information (in the Federal Republic of Germany the information sector now accounts for one job out of every two);

- the boom in information technology markets and the supply of related services (by the end of the 20th century 70% of the whole active population are likely to be directly concerned by NIT).

Lastly, as already mentioned, it is by no means certain that the arrival of an information society like the one currently emerging heralds a more human or humanitarian society (Sweden). It is evident that technical progress does not automatically lead to an enhanced quality of life (Liechtenstein). The battle to be waged in order to ensure that it does should be viewed as one of society's fundamental tasks. It is but one more chapter in the long and painful struggle for the achievement of a truly humanistic democracy.

Amid all this conjecture, one thing is certain: the emergence of the information society is not questioned by a single country.

Technically speaking, the concept of information denotes the signs and coded messages sent by a transmitter (source) to a receiver (1).

The press, radio and television constitute what can already be termed the conventional sources of information.

The Swiss report states that in its main connotation the term "information" is virtually confined to "modern information" (new technologies). This relegates an important aspect of information - the written word - to the background. The report also underlines the difficulty of obtaining a reasonably clear and comprehensive picture of the situation, especially since many aspects are still at the planning stage or are no more than wishful thinking.

The Italian report points to another restriction placed on the meaning of the term "information society", namely the tendency of some to consider its techological aspects only. The report also notes that negative attitudes towards the mass media and NIT are as prevalent among young teachers with little motivation or ability as among their older colleagues.

The Swiss report analyses the role of the media (particularly, the audiovisual media) in education. This role is threefold:

1. a teaching aid that is either: "subordinate"(introduced as a concession to modernity) or

   - "dominant" (expected to play an educational role - as a substitute for the teacher - which it cannot perform) or

   - "an integrated partner".

2. a subject of study or an academic discipline: media studies, semiology, appraisal of information etc.

3. a means of expression: perhaps the most fruitful and least exploited aspect.

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(1) See the MacBRIDE REPORT, Many Voices, One World, abridged edition, Paris, UNESCO, 1986, p. 260.

2.1 THE "CONVENTIONAL" MEDIA

2.1.1 The press in schools

The press was first introduced into schools by teachers who wished to bring a current affairs element into their lessons or had discovered some scientific, historical or literary information in the press which could be of educational value. Such initiatives did not always meet with the approval of the authorities, because of the possible political tendentiousness of the press.

The contribution which can be made by a judicious use of the press in schools is now much more fully recognised and defined thanks to awareness of the advent of the information society. Various systematic schemes have ensued, such as "Actuel Quarto" in Belgium (press file on major events and current issues) and "Krant in de Klas" (The press in the classroom) in the Netherlands (1).

In 1985, the Council of Europe and the Association Région, Presse, Enseignement, Jeunesse (ARPEJ) organised a colloquy entirely devoted to "The press in school" (2).

This meeting not only gave rise to a description of the situation and major initiatives taken in the different countries, but also showed, first, the civic importance of education for and through the press - freedom, democracy, pluralism of expression - and, second, identified the major questions involved. The creation of a European club for the press in school was proposed on that occasion.

The entry of the press into schools represents not so much a technological innovation as a change in educational attitudes: the school is no longer a sterile environment protected from current events and the disturbing questions they often raise, but is opening up to the outside world.

In 1986, the Council of Europe organised a Teachers' Seminar on the theme "Mass media education in primary schools". Particular attention was paid to the press; the report of the meeting brings out well the main aspects of the educational use of the press (3).

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(1) General information on the press in schools can be found in G.B. AMIDEI, Journalism and pedagogy, in UNESCO, Media education, Paris, 1984.

(2) R GERBEX, report of Colloquy on "The press at school", Strasbourg, Council of Europe, CDCC., DECS/EGT (86) 7.

(3) E BEVORT, report of 33rd European Seminar on "Mass media education in primary schools", (Donaueschingen, 6-10 October 1986), Strasbourg, Council of Europe, CDCC., 1986

School education now includes a growing technological element in the shape of the audiovisual media. This element is sometimes exclusive, when it merely involves the use of equipment (overhead projectors, language laboratories, etc), and sometimes partial when information is received from outside sources. Most European countries set up educational audiovisual centres after the second world war, with common types of equipment finding their way into almost all schools. The relative remoteness of these origins may explain the modest place occupied by the "conventional" media (radio, cinema, television and so on) in the national reports.

2.1.2 School radio

School radio made its appearance in the late 1920s, shortly after the large-scale penetration of the European market by radio. The general impression emerging from the national reports is one of dwindling importance for this medium, although it can sometimes develop, as in Switzerland, into a broader form of educational radio which, amongst other things, tackles media education. In Malta, radio is giving way to television, but is continuing to cater for adult education.

2.1.3 Cinema

Cinema entered the classroom very early on, as a considerable body of literature attests. However, its use has remained very restricted in scope. It has mainly been used to give complete lessons (for example, films on venereal disease) or to supplement and illustrate a teacher's instruction (geographical films etc). Having come into use at a time when lessons were of the "ex cathedra" type, films were themselves sources of one-way information, which also explains the decline in the use of the traditional films in schools. Critical study of the cinema, on the other hand, is still strongly established (1).

Although school film libraries or similar services exist in most, if not all, countries, they receive scant mention in the reports. Norway refers to a State Film Board, which is in fact a resource centre from which schools can borrow films, video recordings and other audiovisual material.

Masterman (UNESCO, 1986) comments that wherever media studies treat the media as popular art forms, there is a tendency to give priority to a study of the cinema (the seventh art). The fall in cinema audiences is, however, well-known in many countries (despite a counter-trend in some, notably the Federal Republic of Germany and Luxembourg, as far as young cinema-goers are concerned). At no other time in its history has the cinema had less claim to be recognised as a truly popular art. The bias in its favour seems to be depriving television and press studies of the place they deserve. At the colloquy on "The cinema and audio-visual aids in education systems in Europe : the educational and cultural stakes", held at the Council of Europe in November 1988, the participants addressed a number of recommendations to the 16th Session of the Standing Conference of European Ministers of Education of the Council of Europe based on the consideration that "audio-visual language, through the film and television media, today constitutes the main instrument for mass information, education and culture".

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(1) Abundant information on this subject can be found in Report and Papers on Mass Communication, No. 80, 1987 (Paris, UNESCO).

Among these recommendations is the wish to set up a university network and a European Centre given over to initiation to audio-visual language and education in the film and audio-visual media. (Council of Europe, CDCC, MED-16-HF-48).

2.1.4 School television

The boom in school television occurred during the 1960s. Following a honeymoon period during which some basic mistakes were made, owing to the lack of fundamental didactic training on the part of many producers, enthusiasm began to wane here too. However, the subsequent success of several full-scale educational series, such as "Sesame Street", should be mentioned. A series of Italian television broadcasts intended to improve literacy ("It's never too late") also proved successful. Another interesting development is the increasing importance attached by Switzerland to media education in television programmes for schools.

The introduction of video recorders was a decisive advance, as it enabled teachers to record selected programmes and use them whenever they best suited classroom needs. This point is well illustrated by Malta, which, after making intensive use of school radio, is now switching over to massive use of video recorders. Every school is being supplied with them. A central video library run by the Educational Media Centre will provide software. Television will continue to provide home study programmes after school for one hour a day to a wide age group (3-18 years).

In Turkey, one channel will be used exclusively for educational television.

In French-speaking Belgium, where schools are also equipped with video recorders, only about 7% of pupils now watch school television live.

A sub-system of primary education (fifth and sixth years) has for many years been operating through the Portuguese "Telescola", broadcasting four hours a day to some 60,000 pupils in thinly populated parts of the country. The pupils' results are comparable to those of other pupils. Some modifications have been made, and the sub-system is now integrated into the general system and greater flexibility has been introduced into teaching methods with the use of video cassettes and recorders.

Apart from programmes specially produced for schools, television channels broadcast a large amount of material of considerable educational value, concerning either the media themselves or the more conventional aspects of school curricula. Masterman (1986, pages 6 and 7) cites the outstanding contribution made to Channel 4, in the United Kingdom, by an educational liaison officer responsible for organising the use of an ever-growing number of open, informal educational programmes, which are neither aimed at a narrowly-defined group of learners nor centred on specific study programmes. The officer's department issues sets of companion material, conducts periodic phone-ins, supervises the distribution of a magazine whose readership numbered 180,000 in 1986, facilitates the copying of programmes for educational purposes and arranges various follow-up activities (exhibitions, lectures, meetings between producers and viewers, etc).

More generally, policy in the United Kingdom seems exemplary in so far as it requires all television broadcasting authorities to provide an element of public service broadcasting, notably educational programmes; decisions as to content of programmes rest entirely with the broadcasting authorities themselves.

In this connection, the United Kingdom reports mentions an impressive number of hours per year:

Adult education/continuing education

BBC 1 - 154 hours
BBC 2 - 121 hours
ITV - 156 hours
Channel 4 - 390 hours (plus open college transmissions)

Schools TV per year

BBC 2 - 500 hours
Channel 4 - 375 hours

It therefore seems that the future of educational television has already been largely mapped out.

On the educational aspects of an active television input at primary school, see the report by E BEVORT (1987) mentioned in the context of the press in school.

2.2 INFORMATION TECHNOLOGY

With the arrival of ever cheaper and more efficient micro-computers on the scene, the educational world in all its branches - general, technical and vocational - was unable to ignore the fact that all productive sectors have undergone an information technology invasion.

Huge problems were posed by the need to provide schools with hardware and produce appropriate courseware, and these problems are still largely unsolved. The same applies to the retraining of teaching staff.

Nor is sufficient account being taken of the significant improvements which computers will undergo in the coming years, particularly as far as image and sound quality is concerned.

The report of the OECD Centre for Educational Research and Innovation (CERI) makes a clear distinction between information technology and data communication. "The two technologies that are being studied in the context of the CERI's work are informatics and data transmission. By informatics is meant either a stand-alone computer or a terminal with its various software packages for computer-assisted instruction (CAI), word processing, spreadsheets, data base management and graphics systems, a computer used in multimedia configurations, ie hooked up to slide viewers, videotape recorders or videodisks, or computer controlling teaching aids such as turtle or other types of robot. By data transmission is meant either the linking up of computers in a local network within a school or university, or a hook up with outside networks via a computer or terminal (eg videotex) so as to be able to access data bases, interface with other systems and hook up to distance-learning systems".

2.3 THE NEW MEDIA

These are interactive media which combine audiovisual elements with computers, such as interactive videodisks, or telecommunications-computer combinations. Under the heading of new information technology UNESCO generally includes computers, optical fibres, information and communications satellites, video recordings and so on.

As the Netherlands report points out, none of the countries concerned seems to have a clear-cut overall view of what these new media will mean for schools. It is possible that the ever-expanding range of computer tools (word processing, automatic data search programmes, computerised dictionaries, writing monitoring programmes, etc) will be the first to prove of effective value to schools.

2.4 EDUCATIONAL OBJECTIVES

It is assumed that the new technologies extend an individual's capacities by increasing his ability to reflect on a logical, abstract world and hence embrace much broader and deeper problems than previously. The individual must, however, link these forces, both new and old, with those of other people by first of all communicating with them, an act which has been made very much easier (Federal Republic of Germany).

Education needs to pursue a set of NIT-related objectives in order to serve the interests of individuals as well as society as a whole, viz:

- teaching individuals to interpret the media, ie enabling them to analyse the organisation of messages according to the type of medium and express these analyses verbally (France);
- teaching pupils to use NIT intelligently;
- teaching people to select media according to specific objectives;
- developing people's critical faculties and enabling them to exercise them independently;
- learning to distil the significant from the insignificant (UK);
- making it understood that for one single ephemeral reality, there is a multitude of different representations possible which are not the exact reproduction of the whole of reality and with which it should not be confused (Council of Europe, 1986);
- ensuring compatibility with the cultural heritage;
- offering equal educational opportunities throughout the country and to all groups of inhabitants: different generations, men and women, the disabled, different ethnic groups, immigrants and so on;
- offering equal educational opportunities whatever academic orientation is chosen - general, scientific, literary, vocational, technical or artistic;
- teaching self-expression with the help of the media;

- collaborating with families, firms, employers and employees;

- inculcating a holistic approach to information, so that it is always viewed within its broad philosphical, political and social context;

- enhancing the effectiveness of education for the more highly gifted;

- enabling children and young people to analyse, judge and evaluate the media in the light of their personal responsibility towards themselves.

This kind of education is all the more important as it will frequently have a marked effect on academic perfomance and emotional equilibrium (Federal Republic of Germany).

The Federal Republic of Germany considers that media education as a whole should also serve to transmit values. "It should not only cultivate a sense of judgment but also educate and strengthen moral and social behaviour. It ought not to decrease the possibility of satisfying individual needs and interests". (1) These targets cannot all be met by school education alone.

On the negative side, education should:

- counter the unthinking use of the media

- prevent man from becoming alienated from himself

- avoid any blurring of the boundary between reality and fiction, a phenomenon which the sophistication of present-day media can quite easily bring about in psychologically weak individuals (confusion leading to the adoption of similar attitudes towards real and fictitious situations - France)

- counter the yearning for permanent, instantaneous entertainment

- combat the feeling of insecurity in the face of powerful, ubiquitous media, as well as the escapism that such media can engender

- more generally, allay all ungrounded fears of NIT

- prevent the influx of foreign-language information and films from jeopardising the national language, a special danger for smaller countries (Iceland)

- check the decline in creativity

- combat apathy

- counter the impression that "quality" spells "boredom"

- campaign against vulgarity and bad taste.

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(1) Bund-Länder-Kommission für Bildungsplanung und Forschungsforderung. Materialien zur Bildungsplanung. Heft 16. Gesamtkonzept für die informationstechnische Bildung p.30

A difficult question arises in this connection. Should media education include the presentation of poor-quality or downright obscene programmes? The Danish authorities' response to objections by teachers and parents is that students must be able to tell good from bad and should not therefore be restricted to a study of "cleaned-up" programmes but, on the contrary, should examine the various products of mass communication as made available in everyday life.

- Provide a new form of linguistic expression.

"No media education can exist without language education. A language used solely for processing and transmitting data can be just as important as the language used for complex human communication (with all its ambiguities, ironies and paradoxes). For that reason the various forms of communication should be studied and used so that whichever one is most suitable at a given time can be chosen" (Federal Republic of Germany).(1)

On the subject of objectives, two examples of national positions are worth quoting.

In 1973 Austria issued a decree on media education. In the course of time, such education has become increasingly clearly differentiated from measures concerning the traditional audiovisual media.

The objectives set are:

- to awaken pupils' critical awareness of communication phenomena, so as to turn them into discerning media consumers (critical-mindedness)

- to help each pupil individually to develop his intellectual, affective and linguistic capacities

- to enable pupils to understand and meaningfully experience the structure, means of presentation and effects of the media

- to teach pupils to act creatively in the media field, benefiting from and successfully completing their creative projects.

These objectives should be pursued in all subject areas rather than within one new subject area.

In Denmark the cornerstones of media education are as follows:

- understanding the media, their language and complexity, a prerequisite for a critical and conscious attitude towards media culture.

This training should be placed in its historical, political, economic and institutional context.

- Independent media production

By producing films, videos etc themselves, students can much better appreciate the nature of the media. One-half of media studies time-table is devoted to this activity, and examinations cover this practical aspect to the same extent as the theoretical part.

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(1) Op.cit., p.33

One further aim is to equip students for benefiting from democratised access to the mass media.

On a more fundamental level (Masterman, UNESCO, 1986), media education should:

- convey an understanding of the principle of non-transparency: the media do not simply depict reality as if they were a window opened upon it; they represent it in the light of political, commercial and personal concerns which pupils must / learn to detect.

- explain media rhetoric, ie the techniques used by the media to construct meaning: the selection of sounds and images, situations, situations, narrative structures and so on. (...) This involves learning how to "deconstruct" messages and get beneath their surface.

- show how to identify ideologies. The media give but a selective and partial view of reality, even though this may seem true, national and authentic. Any distortions are not innocent; in particular, values are constantly at stake.

- show how to identify the various interests being served by the images and ideas put forward.

In compulsory education, these aims are pursued indirectly in that they do not constitute a separate subject but are expected to be pursued in all subjects.

However, as already mentioned, an introduction to the media may form a separate subject. The canton of Fribourg in Switzerland has a highly detailed curriculum for the pre-specialisation period of education . General objectives are accompanied by a list of more specific goals to be attained at each level (first-year introductory phase and second and third-year consolidation phase). These specific objectives are set, for knowledge and skills alike.

In the upper secondary schools of most cantons there are either specific courses in (or viewings of) cinematographic works or option courses in the production of Super 8 or video films. Again, in Switzerland, the panorama project is being launched, which will invite children to put together the photographic memory of the country (about 19,000 slides).

"Opération Jeunes-Téléspectateurs-Actifs" a scheme carried out in France between 1979 and 1982, is another example of the measures taken to achieve some of the objectives listed. Using a video recorder, teachers look with their pupils (aged between 3 and 14) at programmes already seen at home and then discuss them with the pupils. (The CIRTEs - Integrated Educational Resources and Technology Centres - have taken over this task). Still in France, the "Plan vidéo collège" is more specifically based on a critical analysis of images and on the production of images which may be combined with the written and spoken word as a means of enhancement.

Malta has adopted a broader approach, having recently introduced a course entitled "Systems of knowledge" in the final year of upper secondary level, which will count as part of the university entrance examination. The course covers the philosophy, history and practice of communication.

CHAPTER 3 - NITC, A NEW FOCUS OF KNOWLEDGE

3.1 EFFECTS ON EDUCATION POLICY

The objectives which most countries wish to achieve have just been explained. The dominant concern is to implement an educational policy appropriate to national society without disregarding the requirements of international interdependence. This interdependence is, of course, primarily of an economic, scientific and military nature, but it is also cultural in that if any culture were nowadays to shut itself completely off from others it would soon become anachronistic because of the phenomenon of universalisation closely linked with the information explosion. Guaranteeing the "right of free access to the products of other cultures" (Portugal) is now more than ever a duty of democrats.

It is also a democratic act to "guarantee individuals as well as society as a whole access to a growing volume of data essential to their autonomy of choice and decision-making" (Portugal). F. Balle referred to the danger of the "electronic gulag" - a very real danger, as George Orwell so eloquently predicted. It is not therefore just education policy but policy as a whole that is at stake - the choice of whether or not to live democratically. It is clear that all the countries concerned are deeply aware of this dilemma.

Consequently, over and above the range of specific objectives assigned to it, education will have the fundamental task of creating an awareness of the significance of life's problems and the existence of information resources capable of providing solutions to them. In short, the aim is to encourage each individual to obtain the requisite information in order to satisfy his own needs rather than those which can only be described as exploiters.

As the Portuguese report clearly puts it, caution should be exercised with regard to commercial manipulations which "give educational administrators and teachers illusions of 'progress' and 'modernity' that have little to do with an effective reform of education".

Clearly, "for there to be a significant improvement in the quality of teaching through the use of educational technology, considerable resources (including time) must first be devoted to training the authors, designers and producers of teaching materials, and the future users of these products" (Portugal).

All countries are aware of the scale of expenditure needed to equip schools adequately. France, Great Britain and others set an early example by launching large-scale planned initiatives in this field.

The report of Dutch-speaking Belgium lists the four major policy options available regarding the acquisition of hardware and software and, possibly, the use which may be made thereof in the classroom:

(i) A fully decentralised policy, leaving all the initiative to schools or even to individual teachers. Teachers and school principals displayed such initiative when low-cost equipment, such as small film projectors, tape recorders or the earliest micro-computers, first came onto the market.

The outcome is well-known. On the plus side, some useful experience of self-instruction was gained by a number of interested teachers, who have since become fully conversant with information technology. The minus side includes an amateurish approach to educational software, whose quality has suffered and continues to suffer from the inadequacy of the material acquired, and from a lack of training and enthusiasm on the part of teachers. Moreover, incompatibility between software packages has created notorious problems.

(ii) A wholly centralised policy [Greece]. The advantages of unified action are obvious. However, matters soon become complex in countries like Belgium, where there are a multiplicity of organising bodies.

(iii) A policy which is initially centralised but accords increasing freedom of action to the "grass roots". This system, which is the one that reflects most fully the principle of adapting educational arrangements to prevailing circumstances, combines the advantages of general unity (particularly with regard to items of equipment and hence their compatibility) with all the positive aspects of an environment-friendly approach.

Some of the reports show clear signs of a trend in this direction, which is probably the one that will prevail in the medium or long term.

(iv) A decentralised policy with limited centralisation in certain areas. This is the approach used in Great Britain and Norway, where it has proved its worth.

The choice between the third and fourth options is directly connected with the whole history of education systems: France and Great Britain offer sharply contrasting examples in this regard.

Whoever the decision-making authority may be, it has in its turn a choice between two policies (OECD-CERI):

- "sectoral" policy, which usually concentrates resources on technical and vocational training;

- "global" policy, directed simultaneously at all levels of education, with computer science, computer awareness and computer-assisted teaching and learning as differential objectives.

A general trend towards the second policy is discernible. Once again, however, there are differences of approach: either resources are scattered among all schools or, as in Norway, efforts are provisionally concentrated on experimental schools. In addition, Norway has launched a major programme of different activities at national and regional levels. This will enable a choice to be made of the most suitable strategies for implementing the programme of education in new information technology.

It is important to note that little is still known about the implications of the large-scale application of NIT to education. Some isolated aspects have emerged haphazardly, but sufficient experimental data is not yet available to permit the real effects of NIT to be gauged (Spain).

This point is of fundamental significance, for it does seem that only large-scale experimental research projects, co-ordinated on a Europe-wide basis, offer any real chance of obtaining in good time the data that will be required if far-reaching educational reforms are not to be embarked upon virtually blindfold.

This is also a matter of general policy, particularly since many European countries are still seriously lacking in educational research institutions or services or networks.

3.2 EFFECTS ON COURSE CONTENT

It is generally felt that not only will the content of all branches of education whether general, technical or artistic, be modified - albeit it to varying degrees - under the influence of NIT: all those taking part in a UNESCO workshop in 1986 on the question of mass media and education (Masterman) acknowledged that the audiovisual media were also powerful teaching agents and would constitute a curriculum parallel to the academic one.

A mastery of oral, written and graphic means of expression and, of course, an understanding of the messages thus transmitted have everywhere become necessary. In France, new subjects and sectors are appearing, such as an information technology option or a cinema/audio-visual option, in upper secondary schools: a senior technician's certificate in the audiovisual media has also been instituted, while in lower secondary schools one of the six interdisciplinary themes to be covered by all teachers, from different angles, is information.

Examples abound of the place being occupied by information and communication technology in various subjects. Mother-tongue and modern-language teaching is, of course, a prime area. But equally striking is the broadening of approach towards such subjects as history, geography and civics, which are increasingly benefiting from the availability of well-stocked data and information banks whose universalisation can open up young citizens' horizons to an extraordinary extent.

To sum up, what needs to be done is not to start from scratch again but to reconcile old yet still valid learning processes with the inescapable new ones (Federal Republic of Germany).

Mass media education is tending to spread throughout school education (France, indeed, is starting at the nursery school stage), and teachers frequently appear to enjoy a large degree of autonomy in this regard.

The specific courses or schemes to be observed in several countries are not replacing the partnership with the various subject areas, but supplementing it. In Malta, a texbook on the media is being distributed in Church-run primary schools on an experimental basis.

In Norwegian schools, media education is integrated into the teaching of the various subjects, particularly the mother tongue, but it may also be covered in greater depth on an option course of 2-3 hours a week at secondary level. In Denmark, systematic instruction in the mass media became compulsory in upper secondary schools on 1 August 1988.

Other countries are less advanced. In Finland, interest in media education has rekindled in recent years. It includes both electrical and graphic communication. Depending on the school and teacher, the content and method of media education vary greatly in Finland. Similarly, in contemplating future prospects for its school system, Liechtenstein is debating the place which the media should occupy.

According to a new Swiss regulation on recognition of secondary school leaving certificates, pupils are required to have taken an information technology course, whatever the type of certificate.

On the specific question of the introduction of computers into schools, the general conclusions reached by OECD-CERI (August 1988) seem appropriate. Firstly, microcomputers may influence classroom management (group work, increased communication among pupils and between teachers and pupils, etc) in all disciplines. Secondly, four changes may be expected:

- The introduction of new technology-related subjects, beginning with computer awareness and computer-aided design.

- Changes in the cognitive content of traditional activities: the mechanisation of calculation means that in the teaching of mathematics more time can be spent on understanding the concepts involved; with the task of rewriting eliminated, more emphasis can be placed on researching ideas, organising a text and so on. Metacognition has a greater part to play in learning.

- The emergence of new activities and topics in existing subjects (quantitative analysis in the social sciences, computer-assisted composition in music, etc)

- Increased use of exploration, discovery and model construction in learning processes.

3.3 EFFECTS ON TEACHING METHODS

Computers can enable types of education to be developed that were not possible with traditional methods and resources (Sweden); and they may even generate a complete reform (CERI).

Reflection on teaching methods leads to the core of the practical problem. Eversince their inception, the purpose of schools has been to impart knowledge through information.

The fact that the sheer quantity of information now available no longer enables individuals to amass encyclopaedic knowledge is of growing significance. Rather than committing information to memory, it is often more important to be able to find it whenever it is required. Databanks may consequently be expected to play an increasing part both in training and in occupational life.

However, locating information whenever necessary is not enough: it still needs to be put to proper use. It is here that the importance of being able to apply the higher cognitive processes, at least in order to construct solutions and take enlightened decisions, becomes evident. The French report, in particular, draws attention to this, emphasising that new instruments such as computers and interactive video disk players enable teachers to stress the active nature of reasoning and learning.

Here, too, there is unanimity: prescriptive, one-way teaching which transmits knowledge, skills and ready-made rules of conduct to be swallowed whole or applied unthinkingly must give way to active learning where the learner, in accordance with Piaget's theories, builds up his own knowledge by functionally interacting with the environment, whether near or far. The Spanish report, among others, gives considerable weight to this aspect.

Because of their almost inevitably multidisciplinary nature, educational projects which open a window on to the outside world enable account to be taken of manifold sources of information to which pupils are exposed: study of the press, televised messages, etc (France).

The multi-media approach sharpens interest (Portugal); the degree of concentration displayed by pupils working, for instance, on the creation and operation of a database has come as a surprise to many observers. Wherever students have such freedom of access to media-transmitted information and data, their intellectual autonomy grows visibly.

Furthermore, the sheer diversification of teaching material (texts, audio material, video, computer programmes) is breaking down the unidirectional character of traditional teaching by encouraging the development of a variety of types of communication between teachers and pupils (Portugal). NIT is also amplifying the long-standing active methods of teaching and giving them a new lease of life.

Sweden deplores the fact that all too often computers in education are, as it were, forced into traditional school work, as a result of which not only do teachers fall behind in their efforts to cover the curriculum but also teaching methods are often imposed from outside. To derive full benefit from the computer as a teaching aid, a teacher must be given opportunities to replace traditional methods with others that are more suited to contemporary situations.

In its discussion of the effects of NIT on school life, the French report cites the example of the transformation of the humble school magazine into a professional-standard publication, with a large circulation among all involved in the educational process as well as local companies.

There is also mention of press briefs being compiled in connection with major events, open days and so on, as well as of pupils themselves producing brochures or videos about their schools.

As for audio information, it is broadcast either for internal consumption or externally, to the local community.

New methods of instruction are emerging. Sweden, for instance, is currently experimenting with different forms of computer-assisted music teaching.

A further possibility is the individualisation or semi-individualisation of teaching.

The sheer multiplicity and flexibility of the new information and communication media, together with the enormous storage capacity of computers, means that increasing personalisation of teaching and learning processes may now be envisaged.

In short, the information society offers opportunities for new thinking and experimentation in the field of educational methodology. NIT allow changes to be made in curriculum content, classroom organisation, teacher-pupils relationships and evaluation techniques (Spain).

3.4 EFFECTS ON THE RECRUITMENT AND TRAINING OF TEACHING STAFF

3.4.1 Recruitment

The national reports provide no information on any communication knowledge and skills required for the purposes of initial teacher training.

France mentions an optional test in computerised information processing, for all state employees as well as an assessment of proficiency in NIT-assisted self-expression and communication in certain competitive examinations for teaching staff.

3.4.2 Initial teacher training

NIT offers vast scope for reforming teaching methods but cannot by itself bring them up to date: unless competent and motivated teachers take on the task, no reform will occur.

According to the Austrian report, all teachers should be able to use computers for teaching purposes with the same ease as other teaching aids or audiovisual techniques. However, as Sweden points out, software is of no value in itself - everything depends on the reasons why it is to be used.

Obviously, it is far easier to provide sound initial training for a relatively small number of trainee teachers than to retrain the millions of teachers already in post throughout Europe (Portugal). For the latter, not only do knowledge and skills have to be improved but - and here lies the most difficult aspect - time-honoured attitudes have to be changed.

Almost everywhere - although, of course in differing ways and degrees - information technology has already become part of initial teacher training. In Ireland, for example, trainee teachers can take an option course on the use of NICT in education, and all colleges of education are equipped with computers to demonstrate their value in primary education. In Belgium, future primary and lower-secondary teachers attend a compulsory information-technology course which focuses on programming logic, the use of software packages and the educational applications of computers.

It may be supposed, however, that training will suffer for a long time yet from the effects of poor quality in educational software. And, indeed, the importance of observing proper practices in the use of NIT in actual teaching and learning situations, whether for initial or for in-service training, cannot be overrated (Spain).

Unfortunately, the declining in birthrate is resulting in fewer new graduates with a practical knowledge of NIT being recruited. Teacher training, is no doubt also affected by the fact that the trainers themselves do not possess sufficient knowledge or experience of the effects of the use of computers on learning processes (OECD-CERI).

Matters are less clear-cut in the case of audiovisual techniques and mass media. It appears that in the great majority of countries an introduction to these fields is provided during initial and/or in-service training (sabbatical periods, short courses, etc). In French-speaking Belgium, in-service training courses are run in the management of media libraries or audiovisual production centres as well as in the operation of closed-circuit television.

The report from the Federal Republic of Germany mentions the absence of information technology courses which could be described as comprehensive and applicable to all categories of teachers. In Norway, by contrast, media education is widespread: each institution is free to adopt a particular programme, provided that it conforms with the general guidelines laid down by the Ministry of Education. These programmes are also available as part of in-service training.

The French report states that communication and information are treated as important elements in the teaching of all subject areas. Training in audiovisual techniques occupies a prominent place, and this seems to be more or less the case in virtually all the other countries.

Austria provides an example of the systematic implementation of a long-term plan. From 1972 onwards, NIT, especially computer techniques was introduced into teacher training - first for mathematics, then for chemistry and descriptive geometry. Now, all areas of general and technical education are gradually being covered.

3.4.3 In-service teacher training

Such training exists everywhere, but the reports give no clear idea of the emphasis placed on information and communication education, apart from computer science (which clearly has priority).

Nevertheless, France has for some years made a major effort to inform and train teachers (Centre de Liaison de l'Enseignement et des Moyens d'Information, CLEMI). Significant steps have also been taken in Portugal, Spain (Mercury Programme), and the Netherlands, among others.

France reports that more than one quarter of all resources available for the in-service training of secondary teachers is allocated to NICT.

Luxembourg runs modular training programmes (4, 8 or 16 hours) for all its teachers, which may be attended partly during and partly outside working hours. The aim is to impart a general knowledge of information technology and encourage the carrying out of educational projects where it is harnessed to the needs of all subject areas.

With the exception of some special cases such as Denmark, where for decades there has been a comprehensive system of in-service training truly accessible to all the country's teachers, it is rare for in-service training schemes to exceed, in either quality or quantity, the critical threshold below which there are no really perceptible effects on the education system as a whole.

In Dutch-speaking Belgium, the conclusion has been reached that distance education is the only means of providing retraining on a large scale. Television programmes designed for this purpose are to begin in January 1989. One of the main reasons for this is that many teachers are at a complete loss in the face of the flood of hardware arriving on the market and the welter of information and other material offered to them. Strict quality checks are to be carried out, and teachers will be informed of their results.

Multimedia self-instruction packages could also play a significant part. Yugoslavia appears to be moving in this direction by preparing modules covering the different aspects of education.

In a small country like San Marino, the majority of teachers can be trained fairly quickly if determined action is taken. Thus in connection with the major project begun in 1988 to introduce information technology at lower secondary schools (11-14), a computer literacy course designed for all teachers of all subjects was attended by two-thirds of them (82 out of 124).

Obviously, conditions are very different in countries where tens of thousands of teachers have to be trained.

In order to reach the vast mass of teachers, Portugal is providing fairly advanced training for a relatively small number of teachers throughout the country who will have a "cascade" effect on their colleagues.

Spain, for its part, is relying on its provincial teachers' centres and its experimental centres, within which teaching teams are being set up with a co-ordinator.

Norway has been running a two-year intensive course on the theory and practice of media education for the retraining of teacher trainers.

The Austrian report gives a clear picture of the methodology of in-service training. It is based on the principle of using teachers' own experience as the starting point. Teachers undergoing in-service training draw up and carry out projects. Discussion of any difficulties encountered is treated as a source of learning. The primary concern is to remain at all times in touch with classroom realities and not to attempt to change everything at the very outset.

The Swedish Government recommends that experimental projects should preferably be conducted by universities which run in-service training courses for teachers, so that the latter may be directly informed and the new techniques brought more quickly into schools.

So as to provide an incentive for in-service training, in the Netherlands computers are supplied only to those primary schools whose staff have attended training courses.

A novel scheme is to be found in French-speaking Belgium: a network known as "Computers for Education", set up by university educational research centres, is permanently available to teachers, parents and all interested parties in general, in order to keep them abreast of questions regarding information technology in relation to education. Demonstrations are given on request and seminars held from time to time. Moreover, a "Club Athena" establishes contacts between leading NIT companies and education officers.

In Ireland, the National Institute of Higher Education plays a similar role, acting as a national resource centre for an exchange of information on NIT. The French Ministry of Education's telematics information service, EDUTEL, is on an even grander scale. Set up in March 1987, it had already received more than a million calls one year later. Another example is the Computer-Assisted Learning Centre at the Education Department of the University of Geneva.

Lastly, the network of interconnected computers that Iceland is installing among all its schools to enable all teachers to communicate with colleagues far and wide for the purpose of exchanging ideas, working together and keeping up with new developments may also be considered a powerful factor for educational progress.

From the above as well as from odd references in other national reports, it transpires - particularly in the field of information technology, but no doubt elsewhere too - that most in-service training activities consist of short courses focused far more on the technology itself than on its implications for teaching methods.

A number of summer schools run by the Commission of the European Communities are attempting to reconcile these two concerns, but they last for only 10 days at a time. As the CERI points out, reforming teachers' theory and practice is a slow and difficult process and the most that such short courses can do is to get the process under way. In any event, no really serious assessment has yet been made of the number and duration of courses to be organised in a given situation.

Moreover, while current research has demonstrated the crucial importance of "opportunities to learn" (to learn to play the piano, both the instrument itself and time to practise are required), it is noticeable that very few teachers are well-off from this point of view. In some countries, nevertheless, experience has shown that just two or three computers available outside the information technology room are sufficient to stimulate a significant increase in the use of computers in the various subject areas.

CHAPTER 4 - NICT AT THE SERVICE OF TEACHING AND LEARNING

4.1 AS AN AID TO SUBJECT STUDIES

This point was raised when teaching methods were being discussed. It is generally acknowledged that all disciplines are concerned. The experimental sciences benefit enormously from computer simulations and the eradication of long and complex calculations, spatial images are of value to geography, geology and biology etc. Television is of great help in the human sciences, in foreign language studies (original-version films) and other subjects which benefit readily from its vivid illustrations.

The National Curriculum English Working Group (UK) has recently stressed the importance of media education in developing major aspects of learning the mother tongue. There is also interesting information in the United Kingdom report on the role the computer can play in the learning of mathematics.

The support which NIT can now offer to the learning of basic skills - reading, writing, arithmetic and "discovery" subjects - is increasingly recognised. The CERI report describes the current scope for enhancing these learning processes as historic (1).

A discordant note is, however, sounded by the Swedish report, which mentions the existence of widely divergent views in Sweden concerning the use of computers for teaching subjects, especially in primary schools. Some seem to fear that early use of computers may be prejudicial to children's development without offering any significant compensatory contribution.

NIT can be of considerable assistance to pupils in overcoming learning difficulties by permitting an individualised and interactive approach (France, Sweden). This point is of special importance at a time when most countries are trying to combat widespread academic under-achievement and, more generally, feel the need to boost educational productivity.

So far, however, it would appear that, despite all its potential, NIT has led to little significant improvement in the situation but rather to have benefited the brighter type of pupil. (France)

4.1.1 Open universities

Wherever open universities (which owe their very existence to recent developments in mass information media) have been fully organised, as in Great Britain, the Netherlands or Denmark, they have proved their worth. While it is true that the initial aim of making higher education available to all has had to be trimmed back because of the process of natural selectivity which has occurred among

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(1) See Information Technologies and Basic Learning: Reading, Writing, Science and Mathematics, OECD, Paris, 1987.

potential students - those already possessing a sound educational basis, such as teachers, are the ones that derive the most benefit from these new structures - the long-term effects may yet prove greater than at present seems likely, since open universities offer advantages which will increasingly be in demand as listed in the Netherlands report:

- the only admission requirement is adulthood;
- students can construct their own courses;
- they can study wherever and whenever they wish;
- they can progress at their own pace.

Open universities are an invaluable testing ground for adult education methods as well as for the educational applications of information technology.

From an organisational point of view, Finland is unique in not having set up any new institutional framework for its open university. Each higher education institute makes its own open-university arrangements, generally in co-operation with civic or workers' institutes. At first, conventional courses were offered, but now distance learning is developing (radio, television, tele-conferences, video conferences, etc). Optimum results are being achieved with a blend of the two types of teaching.

An exploratory project intended for secondary education is currently under way in the Netherlands.

Several countries are planning to establish open universities. Portugal, in particular, has recently completed preparatory work on its "Universidade Aberta", which in 1992 will be able to cater for some 40,000 students.

Pupils must be initiated in <u>independent learning</u> at a very early stage, if only because they will be required to go on learning throughout their lives. This accounts for the creation, particularly in school documentation centres, of autonomous work stations where pupils may consult image- or data-bases, use computer-guided videodisks, access Minitel-type computerised information networks and so on.

In countries like Belgium where dense telediffusion networks cover the entire national territory, opportunities for home study will expand rapidly once interactivity becomes possible.

4.1.2 <u>Distance learning</u>

The beginnings of distance education go back to the last century, but the NICT are giving it new impetus. For example, as early as 1970, Portugal launched a vast programme based on television.

Because of its outstanding experience in the matter, Denmark occupies an exemplary place in distance learning. It distinguishes between three models historically linked with technological progress:

a. Correspondence learning, which experienced a boom in the late 19th century with the advent of new printing techniques and the railways.

b. Multi-media distance learning, which has been developing since the 1960s with the combined use of printed material, radio, cassettes and, to some degree, computers. Telephone counselling is sometimes provided and face-to-face tutorials are arranged.

A feature of both these periods is the practically one-way direction of information: it is sent to the learner, whose interaction with his instructors is minimal. The distance marker either approves or disapproves, the student attempting to give whatever answers he thinks will please the tutor. The result has been a social bias - those who are already well educated benefit most from the opportunities offered.

c. Communication is the key-word of the third-generation model. Thanks to interactivity, pupils can at last use their own language. Tele-conferences are destined to play a major role here: the Open University of Jutland is currently carrying out a series of searching experiments with the relevant technological aspects.

Further noteworthy distance-learning schemes are Austria's "radio college", broadcasting a wide variety of programmes which may be borrowed or bought by the public, and France's extensive CNED (National Centre for Distance Learning - previously the National Centre for Correspondence Learning), which makes increasing use of the new communication techniques and caters for all students, levels and subject areas; 240,000 students are currently registered, including 160,000 adults.

In 1977 Norway created a state-run distance learning body (State Institute of Distance Education): television, video recordings and conventional textbooks were from the outset selected as means of transmitting information.

Finland has a more selective approach, giving priority to general or vocational education for adults.

Lastly, the growing feasibility of distance learning is clearly of special interest to certain thinly populated countries or regions (Iceland, Sweden). Sweden, for example, uses videotex, radio and television as teaching aids for pupils living in remote country areas. Economics programmes for companies and information technology courses for adults are distributed in the same way.

The following conclusion reached by UNESCO seems appropriate: "Application of NIT to distance education is growing with the development of network facilities, improved accessing to active information banks, home learning stations, videotex and electronic mail, digital transmission, diversification of interactive tools allowing home tuition and individualised learning assistance".

In May 1988, the Commission of the European Communities emphasised the need to exploit the potential of distance learning for education and in-service training.

4.2 EDUCATION OF THE DISABLED

Virtually all disabled people will soon have access to substantial technological support. Just as, thanks to advances in robotics, sophisticated prosthetic appliances are being developed for those suffering from motor handicaps, so information technology is providing increasingly valuable help for those with sensory handicaps,

particularly by means of computers conveying speech (synthetic or natural) and images (digitalised or otherwise). The United Kingdom mentions in particular the use of information technology for helping children with severe communication problems generally arising from cerebral palsy or head injury.

Many countries refer to the education of the disabled. Norway, which has a National Institute of Special Education, runs a half-year course for trainee teachers in NIT-based education for the disabled, and comparable in-service courses are also available. A number of advanced schemes exist in France, the Netherlands, the Federal Republic of Germany, Switzerland and elsewhere. In Sweden, special funds are set aside for the purchase of hardware and software for educational establishments. It is hoped in particular that the variety of aids provided by computers will enable even the seriously disabled to be better integrated into the regular education system.

The role which computers play in the education of the disabled is primarily of a technical nature. As France points out, the problems and potentialities of computer-assisted learning are practically the same for the disabled as for others.

CHAPTER 5 - COPYRIGHT

The copyright problem is becoming increasingly acute: photocopiers, tape-recorders and video recorders are to be found in many schools and homes; the ease with which sometimes highly expensive software packages can be pirated is well known.

It emerges from the Austrian report, which pays particular attention to this question, that except where production, copying and distribution, are covered by proper contracts, the situation is far from clear. Whenever legal proceedings are instituted, the courts tend to side with the authors.

Two important legal concepts are examined: "free use of productions for one's own use" and "public character".

An event is deemed to be public if it is open to all. It is not public if it is restricted to participants who are not directly related to each other but have real personal ties with each other or who have a personal relationship with the organiser of the event. These conditions seem to apply, for example, to a pupil who records a TV programme with his private video recorder and then shows his recording to his class for purely educational purposes.

Problems may arise when such recordings are shown, whether simultaneously or not, to several classes or when a teacher records a television programme for several classes.

A similar distinction applies to photocopies, although here the legal situation appears even vaguer.

The Austrian Ministry of Education supplies schools with regular information on copyright problems and the relevant statutory provisions.

In Switzerland, new statutory arrangements envisage reduced rates for schools, but without giving schools any kind of privileged position with regard to the actual principle of copyright. The Nordic Countries' Council of Ministers is currently concluding a series of copyright agreements.

The European workshop held by UNESCO in 1986 on mass media and education recommended that copyright be abolished in respect of the use for educational purposes of all publicly issued material.

On the level of general principle, the European Audiovisual Charter - the European Charter for the defence and future of audio-visual creation adopted in Delphi in September 1988 by participants from 20 countries stipulates (Article 4) that the author has "an exclusive incorporeal proprietary right which shall be valid erga omnes".

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